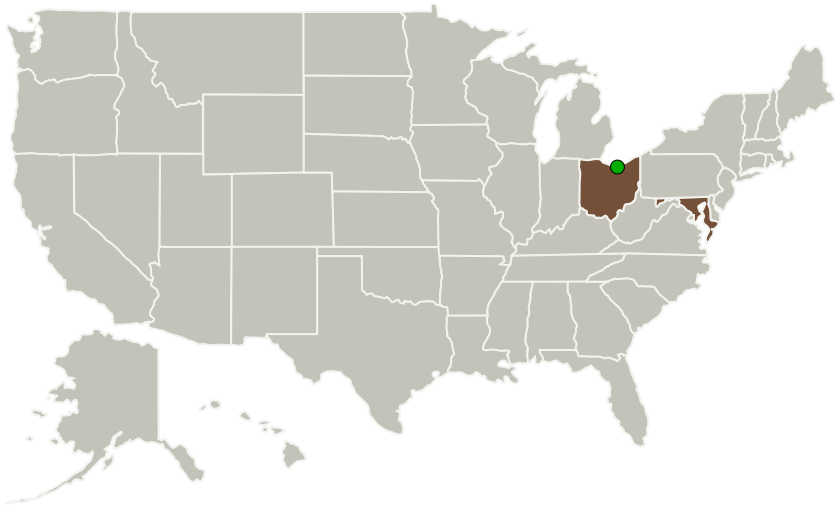
A Novel High Gain Active Reflect Array Antenna Architecture for Small Spacecraft, Phase I

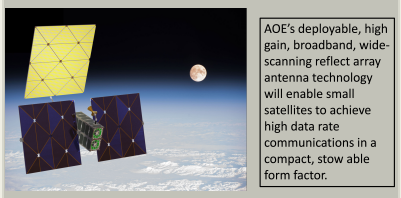
Completed Technology Project (2017 - 2017)

Project Introduction

The objective of this Phase I SBIR effort is to develop and demonstrate an advanced, deployable, high gain, active reflect array antenna for use in high data rate transmission to, from and among small spacecraft. While the antenna architecture proposed by AOE can be targeted for frequencies from below L-band to Ka-band and higher, AOE has selected X-band for a demonstration array for this proposed effort. Under the Phase I effort, AOE and LoadPath will focus on achieving an efficient deployable reflect array configuration and, within the trade space of reflect array architectures, will explore several approaches and perform the trade analyses in terms of performance, cost, size, weight and power. The results of this investigation will yield a high gain antenna architecture that will support future NASA and commercial small satellite communication operations. During the Phase I effort, the array deployment mechanism will be demonstrated with hardware while a complete beam-scanning reflect array antenna will be demonstrated with hardware during the Phase II effort.

Primary U.S. Work Locations and Key Partners





A Novel High Gain Active Reflect Array Antenna Architecture for Small Spacecraft, Phase I Briefing Chart Image

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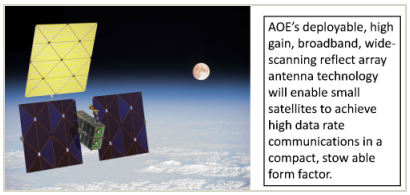
Organizations Performing Work	Role	Type	Location
Alpha Omega Electromagnetics, LLC	Lead Organization	Industry	
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Maryland	Ohio

Images



Briefing Chart Image
A Novel High Gain Active Reflect Array Antenna Architecture for Small Spacecraft, Phase I Briefing Chart Image *(https://techport.nasa.gov/image/129760)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Alpha Omega Electromagnetics, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

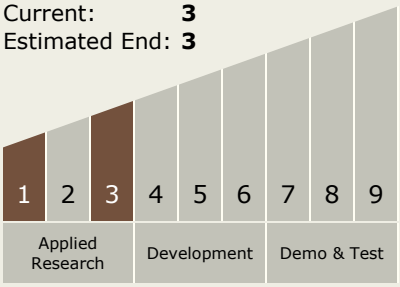
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Robert Schmier

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.6 Innovative Antennas

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System